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## STUDIES OF SOME BOREAL AMERICAN CERASTIUMS OF THE SECTION ORTHODON.

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IN attempting to make out the exact identities of our Newfoundland and Labrador collections of *Cerastium* we have found it necessary to study closely the perennial species of northern range and in so doing have drawn up a key to the boreal American species of the section *Orthodon*, the plants which have passed in America under the composite species, *C. alpinum* L., *C. vulgatum* L. and *C. arvense* L.

Our conclusions from the study of *C. alpinum*, *C. vulgatum*, and their allies are somewhat unlike those in other recent American publications and they are here recorded as the best we are able to reach with our present understanding of the group. In this work we have had the advantage of studying, besides the material of the Gray Herbarium and of the New England Botanical Club, the collections of the Geological Survey of Canada kindly loaned us by the late J. M. Macoun and those of the Philadelphia Academy of Sciences placed at our disposal by Mr. Bayard Long.

### KEY TO BOREAL AMERICAN SPECIES OF SECTION ORTHODON.

- a. Bracts herbaceous or only the uppermost slightly scarious-margined b.
- b. Seeds small, 0.6-1 (rarely -1.3) mm. in diameter
- c.
- c. Pubescence, at least of the basal tufts, long and more or less entangled especially at the tips of the leaves, or even lanate; plant

- obviously glandular above or with glands obscured by the tomentum: cyme not conspicuously dichotomous; pedicels usually long and ascending: sepals large, in anthesis 5.5-9, in fruit 6-10 mm. long: capsule 9.5-20 mm. long: seeds 1-1.3 mm. in diameter . . . . . 1. *C. alpinum*.
- c. Pubescence short, pilose to hirsute, often scanty; plant usually glandular at least above: cyme (when well developed) rather conspicuously dichotomous (as in *C. vulgatum*): sepals in anthesis 3.5-7.5, in fruit 4.2-9 mm. long: capsule 5-12 mm. long: seeds 0.6-1 mm. in diameter.  
 Petals 6-8(-9) mm. long: leaves (not the bracts) linear- to elliptic-oblong, mostly obtuse . . . . . 2. *C. Beeringianum*.  
 Petals 9-12 mm. long: leaves broadest near the base, lanceolate to lance-oblong or lance-linear, or even narrowly ovate, acutish . . . . . 3. *C. Fischerianum*.
- b. Seeds large, 1.3-3 mm. in diameter d.  
 d. Plants low, 0.2-1.8 dm. high, glandular-pubescent at least above or very rarely only short-hirsute: median leaves 0.5-2 cm. long, 1-4(rarely -8) mm. broad, linear-oblong, rarely oval or the bracteal ovate: flowers 1-7: pedicels ascending or slightly spreading: mature capsule 8.5-13 mm. long e.  
 e. Leaves of the season 2-5 pairs below the inflorescence: seeds with a close testa, rather regularly blunt-papillose, not angled.  
 Leaves oval-elliptic, obtuse: flowers 1-3: sepals ovate-lanceolate to oval: seeds 1.5-3 mm. in diameter . . . . . 4. *C. arcticum*.  
 Leaves ovate-lanceolate to linear-oblong, acute or acutish: flowers 1-7: sepals lanceolate to ovate-lanceolate: seeds 1.3-1.8 mm. in diameter . . . . . 5. *C. Earlei*.
- e. Leaves of the season 5-10 pairs below the inflorescence: seeds with a loose testa, rather sharply papillose on some surfaces, with rows of linear or oblong transverse ridges on other surfaces, angled . . . . . 6. *C. terrae-novae*.
- d. Plants tall, 2-4 dm. high, densely sordid-hirsute especially above; glands if present not obvious: leaves large, the median 1.5-4 cm. long, 0.8-2.5 cm. broad, ovate to oblong, mostly rounded at base: flowers 3-13; pedicels soon reflexed or recurved: mature capsule 1.7-2.3 cm. long . . . . . 7. *C. unalaschkense*.
- a. Bracts broadly scarious-margined or only the very lowest wholly herbaceous.

Basal leafy branches and offshoots herbaceous, with few axillary tufts of oblong leaves: petals about equalling to  $\frac{1}{2}$  longer than the sepals, with ascending lobes and pubescent or ciliate claw.

Sepals 7–10 mm. long: capsule 1.7–2.3 cm. long: seed 1.3–1.8 mm. in diameter . . . 7. *C. unalaschkense*.

Sepals 4–7 mm. long: capsule 7–11 mm. long: seed 0.5–0.7 mm. in diameter . . . 8. *C. vulgatum*.

Basal branches and offshoots becoming dry and marcescent, bearing conspicuous axillary fascicles or leafy tufts: petals 2–3 times as long as the sepals; the broad lobes spreading during anthesis; the claw glabrous . . . 9. *C. arvense*.

1. *C. ALPINUM* L. Densely or loosely matted; the flowering stems weak, 0.1–3 dm. long, hirsute, glandular or lanate; the basal offshoots lanate or at least their leaves with the pubescence entangling at tip: leaves of the season oval, oblong, lanceolate or narrowly ovate, 0.5–2 cm. long; bracts similar or the uppermost slightly scarious-margined: flowers 1–6: pedicels straight, strongly ascending, finally spreading, much longer than the calyx, in fruit becoming (except in extremely dwarfed forms) 1.5–5 cm. long: sepals ovate-lanceolate, in anthesis 5.5–9, in fruit 6–10 mm. long: petals cuneate-obovate, about twice as long as the calyx; the 2 oblong lobes ascending: capsule nearly straight, 0.95–2 cm. long: seeds tuberculate, 1–1.3 mm. in diameter.—Sp. Pl. i. 438 (1753).—A very variable arctic-alpine species, represented with us by the following varieties.

Var. *LEGITIMUM* Lindblom. Summit of stem, pedicels and calyx with straight short glandless pubescence.—Physiograph. Sallsk. Tidskr. i. 336 (1837)—reprinted in part in Flora (1841) 591. *C. alpinum* L. sensu stricto. *Centunculus alpinus* (L.) Scop. Fl. Carn. ed. 2, i. 321 (1772). *Stellaria alpina* (L.) S. F. Gray, Nat. Arr. Brit. Pl. ii. 660 (1821). *C. mutabile alpinum* (L.) Gren. Mém. Soc. Émul. Doubs, i. 71 (1841). *C. alpinum*, var. *hirsutum* Fenzl in Ledeb. Fl. Ross. i. 411 (1842).—Arctic regions, south on granitic, schistose or silicious rocks and gravel to Labrador, Ungava and Keewatin. The more southerly stations are as follows. LABRADOR: Kangalaksiorvik Bay, September 1–10, 1908, Owen Bryant; 20 miles north of Nachvak, August 28, 1908, H. S. Forbes; near Hopedale, Knuth; Indian Harbor, Hamilton Inlet, August 2, 1891, Bowdoin College Exped., no. 175; St. Francis Harbor, July 20, 1891, Bowdoin College Exped., no. 112; Dumpling Harbor, July 7, 1864, B. P. Mann. UNGAVA: Port Burwell, Hudson Straits, July 18, 1910, J. M. Macoun, no. 79,081; Digges Island, September 16, 1884, R. Bell; Great Whale River, Hudson Bay, July 5, 1899, A. P. Low, no. 63,164, in part. KEEWATIN: Churchill, August 15, 1879, R. Bell, no. 4216, August 18, 1910, J. M. Macoun, no. 79,082; Cape Henrietta Maria, August 18, 1904, Spreadborough, no. 62,328.

Forma *PULVINATA* Simmons, Vasc. Pl. Ellesmerel. 122 (1906).—A condensed arctic form with succulent glabrous leaves.

Var. *GLANDULIFERUM* Koch. Similar to var. *legitimum* but pubescence gland-tipped or mixed with glands: plant greenish.—Syn. Fl. Germ. 124 (1835).—Of similar range, south to southeastern Labrador and Hudson Straits. The following are the more southerly stations. LABRADOR: Rama, August, 1897, *J. D. Sornborger*, no. 205, in part; Hebron, August 4, 1908, *H. S. Forbes*; Caribou Island, August 6–13, 1911, *C. S. Williamson*, no. 571.

Var. *GLUTINOSO-LANATUM* Facchini. Inflorescence villous and conspicuously glutinous or with dark gland-tipped hairs: plant lurid: calyx dark.—Facchini in Reichenb. Deutsche Fl. der Nelkengew. iii. 110 (1842–43). *C. atratum* Lapeyr. Hist. Abr. Pl. Pyr. 265 (1813). *C. squalidum* Ram. Act. Acad. Paris, vi. 158 (1826). *C. mutabile alpinum*  $\epsilon$ . *squalidum* (Ram.) Gren. Mém. Soc. Émul. Doubs. i. 72 (1841). *C. alpinum*  $\delta$ . *atratum* (Lapeyr.) Rouy & Foucaud, Fl. Fr. iii. 205 (1896).—Greenland and the northwest side of HUDSON BAY: Wager Inlet, lat. 65° 15', September 8, 1910, *J. M. Macoun*, no. 79,084.

Var. *LANATUM* (Lam.) Hegetschw. Plant covered with long entangling pale often flocculent tomentum, not glandular.—Reisen. 154 (1825). *C. lanatum* Lam. Encycl. i. 680 (1783–84). *C. villosum* Baumg. Enum. Stirp. Transs. i. 424 (1816). *C. eriophorum* Kitaib. in Rochel, Plant. Banat. Rar. in ind. (1828). *C. lanuginosum* Willd. ex Reichenb. Fl. Germ. Exc. 797 (1832). *C. mutabile alpinum*  $\delta$ . *lanatum* (Lam.) Gren. Mém. Soc. Émul. Doubs, i. 72 (1841). *C. alpinum*, d. c. *villosum* (Baumg.) Kittel, Taschenb. Fl. Deutschl. ed. 2, 975 (1844).—The most southerly variety, reaching the Straits of Belle Isle and the foot of James Bay. The southern specimens examined are as follows. LABRADOR: Eclipse Harbor, September 6, 1908, *H. S. Forbes*; Rama, August 20–24, 1897, *J. D. Sornborger*, no. 202; Makkovik, August, 1896, *A. Stecker*, no. 197; Nain and Ford's Harbor, August 1, 1884, *R. Bell*; Nain, August 11, 1897, *J. D. Sornborger*, no. 52; Tub Harbor, July 11, 1892, *J. D. Sornborger*, no. 211; Gready Island, August 8, 1908, *Owen Bryant*; Indian Harbor, July 28, 1892, *Waghorne*; Battle Harbor, *Bowdoin College Exped. et al.*; Chateau Bay, July 14, 1891, *Bowdoin College Exped.* no. 57; Forteau, 1870, *S. R. Butler*; very abundant on dry, exposed crests, Blanc Sablon, July 30, 1910, *Fernald & Wiegand*, no. 3392. UNGAVA: Fort Chimo, September 8, 1896, *Spreadborough*, no. 34,357; along the Koaksoak River, August 16, 1896, *Spreadborough*, no. 16,290; Digges Island, Hudson Strait, August 16, 1884, *R. Bell*; Great Whale River, Hudson Bay, July 5, 1899, *A. P. Low*, no. 63,164, in part; South Twin Island, James Bay, August, 1887, *J. M. Macoun*, no. 34,356; Charlton Island, James Bay, July 8, 1887, *J. M. Macoun*, no. 4616.

2. *C. BEERINGIANUM* Cham. & Schlecht. Plant densely or loosely matted, with spreading or ascending glandular-pilose stems 0.4–2 dm. long; upper internodes (1.5–)2.5–7.5 cm. long: leaves of the season 2–5(–7) pairs, linear to elliptic-oblong, mostly obtuse, pilose on both

faces; the median 0.7–2.4 cm. long, 1.5–7 mm. broad: bracts ovate to oblong-lanceolate, acutish; margins not scarious: inflorescence simple or dichotomous, 1–14-flowered; pedicels usually slender, mostly ascending, rarely nodding at the tip, in maturity 0.5–3 cm. long: sepals in anthesis 3.5–7, in fruit 4.2–8 mm. long, broadly lanceolate to oblong-ovate, obtuse, the inner conspicuously scarious-margined: petals bluntly 2-lobed, 6–8(–9) mm. long, ascending, only slightly exceeding the calyx: capsule 8.5–12 mm. long: fruiting calyx campanulate, 4–6.5 mm. broad at summit: seed 0.6–1 mm. in diameter, bluntly papillose, not angled.—*Linnaea*, i. 62 (1826). *C. vulgatum*,  $\delta$ . *Beerianum* (Cham. & Schlecht.) Fenzl, in Ledeb. Fl. Ross. i. 409 (1841). *C. alpinum*,  $\alpha$ . *Beerianum* (Cham. & Schlecht.) Regel, Plant. Radd. i. 434 (1862). *C. Buffumae* A. Nelson, Bull. Torr. Bot. Cl. xxvi. 239 (1899). *C. variabile* Goodding, Bot. Gaz. xxxvii. 54 (1904). *C. pilosum* Greene ex Rydb. Fl. Col. 129 (1906), not Ledeb.—Calcareous rocks, western Newfoundland and Straits of Belle Isle to Rimouski Co., Quebec; Keewatin; Alaska to Arizona; also northwestern Asia. The more easterly stations are as follows. NEWFOUNDLAND: dry, rocky limestone barrens, near sea-level, Ingornachoix Bay, August 4, 1910, *Fernald & Wiegand*, no. 3391; damp calcareous rocks and talus, entrance to Port Saunders Harbor, August 1, 1910, *Fernald & Wiegand*, no. 3391½. QUEBEC: rocky crest, Ile Herbée (Grassy Island), Archipel du Vieux-Fort, Saguenay Co., July 24, 1915, *St. John*, no. 91,817; turfey ledges, Ile Triple, Archipel Washicoutai, Saguenay Co., July 7, 1915. *St. John*, no. 90,819; rocky limestone headland, Pointe aux Eskimaux, Seigniory de Mingan, Saguenay Co., June 28, 1915, *St. John*, no. 90,818; crests of cliffs, Cap Blanc, Percé, Gaspé Co., August 17, 1904, *Collins, Fernald & Pease*; limestone detritus, Cap Blanc, Percé, July 26, 1905, *Williams, Collins & Fernald*; red limestone detritus, Les Murailles, Percé, August 17, 1904, *Collins, Fernald & Pease*; along the cliffs below Ste. Anne des Monts, Gaspé Co., August 12, 1882, *John Macoun*; mossy sea-cliffs, Tourelle, Gaspé Co., August 21, 1905, *Collins & Fernald*, no. 73; calcareous ledges and cliffs at various stations, Bic, Rimouski Co., *Collins & Fernald et al.*; crevices and talus of limestone-conglomerate sea-cliffs, altitude 200–275 m., east of St. Fabien, Rimouski Co., July 16, 1907, *Fernald & Collins*, no. 1032.

Var. **capillare**, n. var., caulibus capillaribus, pedicellis filiformibus plerumque 1.5–5.5 cm. longis; foliis lineari-oblongis; calycibus maturis 3–4 mm. diametro; capsulis 5–7 mm. longis breviter exsertis.

Stems capillary: pedicels filiform, mostly 1.5–5.5 cm. long: leaves linear-oblong: mature calyces 3–4 mm. in diameter at summit: capsule 5–7 mm. long, very slightly exserted.—ALBERTA: broken rocks, head of Lake Louise, July 22, 1904, *J. Macoun*, herb. Geol. Surv. Can. no. 64,720 (TYPE in Gray Herb.); Lake Louise, July 14, 1906, *Stewardson Brown*, no. 715.

The sheet of no. 64,720 in the Herbarium of the Geological Survey of Canada contains also typical *C. Beerianum*.

3. *C. FISCHERIANUM* Seringe. Loosely matted, with spreading or ascending glandular-hispid flowering stems 0.7–4 dm. long; upper internodes (except in dwarfed arctic specimens) becoming 0.4–1.2 dm. long; leaves of the season 3–7 pairs, broadest near the base, lanceolate to lance-oblong or lance-linear, rarely ovate, mostly acutish, pilose on both faces; the median 1–4.2 cm. long, 0.3–1.6 cm. broad; bracts lanceolate to ovate, acutish, herbaceous; inflorescence dichotomous, (1–)3–27-flowered; pedicels at first ascending, after anthesis nodding at tip or strongly divergent, in maturity 1.5–4 cm. long; sepals in anthesis 4.5–7.5, in fruit 5.5–9 mm. long, lanceolate to oblong, acute or acuminate; petals bluntly 2-lobed, 0.9–1.2 cm. long, ascending; capsule 0.9–1.2 cm. long; seeds 0.7–1 mm. in diameter, bluntly papillose.—Seringe in DC. Prodr. i. 419 (1824). *C. alpinum*,  $\gamma$ . *Fischerianum* (Seringe) Torr. & Gray, Fl. i. 188 (1838). *C. vulgatum*,  $\delta$ . *grandiflorum*, lusus 1, Fenzl in Ledeb. Fl. Ross. i. 411 (1841).—Siberia to Japan and Alaska; southern Labrador to the Gaspé Peninsula, Quebec. The eastern specimens examined are as follows. LABRADOR: waste places near dwelling, Battle Harbor, August 16–18, 1911, *C. S. Williamson*, no. 695; springy banks and damp hillsides, Forteau, July 30, 1910, *Fernald & Wiegand*, no. 3388; abundant in damp runs and on mossy banks, limestone and calcareous sandstone terraces, Blanc Sablon, August 1, 1910, *Fernald & Wiegand*, no. 3389 (also noted on the Quebec side of Blanc Sablon River). QUEBEC: Blanc Sablon (see preceding note); Bonaventure conglomerate (calcareous) sea-cliffs, Bonaventure Island, Gaspé Co., August 7 & 8, 1907, *Fernald & Collins*, no. 1034; limestone detritus along outer bases of Les Murailles, Percé, Gaspé Co., August 10, 1907, *Fernald & Collins*, no. 1035.

4. *C. ARCTICUM* Lange. Plant very low and densely tufted; the stems 0.3–1 (rarely –2) dm. long, viscid and pilose; internodes short, the median 0.3–2 cm. long; leaves of the season 3–5 pairs, 0.5–1 cm. long, oval or elliptical, rarely oblong, obtuse or acutish, pilose, those of the sterile shoots sometimes villous; bracts broadly ovate, scarcely scarious; inflorescences 1–3-flowered; pedicels erect or spreading, slender, sometimes nodding at tip; sepals in anthesis 4–7 mm. long, ovate or ovate-lanceolate, obtuse or acutish, scarious-margined; petals broad, 0.9–1.3 cm. long; capsule once and a half to twice as long as the sepals; seeds 1.5–3 mm. in diameter, papillose.—Fl. Dan. Fasc. 50, p. 7, t. 2963 (1880), in part. *C. latifolium*,  $\beta$ . *Edmondstonii* H. C. Watson in Edmonst. Fl. Shetl. 29 (1845). *C. Edmondstonii* (H. C. Watson) Murbeck & Ostenf. Bot. Notiser (1898) 246. *C. nigrescens* Edmondston ex Ostenfeld, Med. om Grönl. xxxvii. 224 (1920).—Northern Europe and perhaps arctic America. Here are doubtfully referred two immature collections as follows. MEL-

VILLE ISLAND: Parry's 1st Voyage, 1819-20. ALASKA: Point Barrow, July 3, and 7, 1883, *John Murdoch*.<sup>1</sup>

Ostenfeld has recently taken up *C. nigrescens*, ascribing it to Edmondston and dating it from the Flora of Shetland (1845). It was there published, however, in synonymy only, as a synonym of *C. latifolium*,  $\beta$ . *Edmondstonii* and therefore, published merely as the synonym of a name in the varietal rank, cannot be cited as a valid binomial of that date. The name *C. arcticum* Lange originally covered a mixture, part of it generally conceded to be a hybrid. The true species involved was the present plant. Many authors are inclined to drop the name *C. arcticum* or to restrict it to a hybrid, but we follow Druce in Moss, *Cambr. Brit. Fl.* iii. 47 (1920).

5. *C. EARLEI* Rydberg. Plant low, 0.5-1.8 dm. high, varying from slender to rather stout, more or less densely glandular-puberulent especially above: upper internodes rather long (2-4.5 cm.): leaves narrowly oblong to elliptic, obtuse or subacute, glandular-pubescent, those of the season 2-5 pairs; the median 1-2 cm. long, 2-6(-8) mm. broad: bracts ovate to lanceolate, the upper sometimes slightly scarious-tipped: inflorescence 1-7-flowered, usually not conspicuously dichotomous: pedicels in maturity slender, erect or somewhat spreading, often arching at tip, 1.2-2.8 cm. long: sepals commonly fuscous or purplish, in anthesis 5-9, in fruit 7-10 mm. long, lanceolate to ovate-lanceolate, acute or sub-acute, glandular-puberulent, with a broad scarious margin: petals rather showy, once and a half to twice the length of the sepals, ascending: capsule 8.5-13 mm. long: seeds 1.3-1.8 mm. in diameter; the close testa bluntly but strongly and uniformly papillose—*Bull. Torr. Bot. Club*, xxx. 249 (1903).—Calcareous regions of the Rocky Mountains, Alberta and British Columbia to Arizona. The following specimens mostly distributed as *C. Beeringianum*, are characteristic. ALBERTA: mountains at Kicking Horse Lake, August 14, 1890, *J. M. Macoun*; back of Tunnel Mt., Banff, June 13, 1899, *J. Macoun*, no. 22,349 in part; Vermillion Mt., Banff, July 9, 1891, *J. M. Macoun*; Bow River Pass, September 13, 1879, *J. Macoun*, no. 99; Forget-me-not Mt., Elbow River, July 16, 1897, *J. M. Macoun*, no. 18,249; Lake Louise, July 14 and 25, 1906, *Stewardson Brown*, nos. 702, 706. BRITISH COLUMBIA: Upper Loup Creek, near Glacier, July 29, 1914, *E. W. D. Holway*; summit of Wapta, alt. 3050 m., July 10, 1906, *Stewardson*

<sup>1</sup> Ostenfeld reports from King William Land an extreme arctic species, *C. Regelii* Ostenfeld, *Vid.-Selsk Skrift. Math.-Naturv. Klasse*, 1909, no. 8, 10 (1910), a very slender, nearly glabrous plant with filiform branches; elliptic short leaves; filiform pedicels and rounded sepals 4.5-6 mm. long, with membranous violet-tinged margins. He does not describe the seed; and the only material we have seen (from Siberia and a very young and doubtful plant from Cape Nome, Alaska, *Blaisdell*), is too immature to show seed-characters.

*Brown*, no. 446; Little Yoho Valley, July 13, 1906, *Stewardson Brown*, no. 465; Fraser River, Yellowhead Pass, July 16, 1898, *W. Spreadborough*, no. 19,284. MONTANA: Upper Marias Pass, August 3, 1883, *W. M. Canby*, no. 40; Mt. Stanton, August 1, 1894, *R. S. Williams*. COLORADO: Sawatch Range, alt. 3660 m., 1880, *T. S. Brandegee*; Cumberland Basin, La Plata Mts., alt. 3600 m., July 15, 1898, *Baker, Earle & Tracy*, no. 621; head-waters of Clear Creek, 1861, *Parry*, no. 138 in part. ARIZONA: Mt. Agassiz, alt. 3050 m., August, 1884, *J. G. Lemmon*, no. 3288; Humphrey's Peak, San Francisco Mt., August, 1898, *MacDougal*, no. 406.

6. *C. terrae-novae*, n. sp., planta fusca vel purpurascens; caulibus ascendentibus vel suberectis glanduloso-hirsutis valde foliosis 0.6–1.5 dm. altis; internodiis brevibus, mediis 0.5–2.5 cm. longis; foliis novellis purpurascensibus 5–10-jugis elliptico-oblongis obtusis basi paullo angustatis dense glanduloso-hirsutis 0.5–1.4 cm. longis 1.5–3.5 mm. latis; bracteis ovato-lanceolatis acutiusculis vel obtusis vix scariosis; floribus 1–3; pedicellis gracilibus plerumque erectis deinde 1.5–2.5 cm. longis apice vix nutantibus; sepalis ovato-oblongis obtusis vel subacutis fuscis glandulosis late scarioso-marginatis 5.5–6.5 deinde 6–7 mm. longis; petalis obtuse 2-lobatis ascendentibus calyce duplo longioribus; capsulis rectis 0.9–1.3 cm. longis; seminibus 1.3–1.7 mm. diametro angulatis, testa vesicula aliis faciebus argute papillosis aliis cum liris parvis transversis seriatim dispositis instructis.

Plant fuscous or purple: stems loosely ascending or suberect, densely glandular-hirsute, very leafy, 0.6–1.5 dm. high: internodes short; the median 0.5–2.5 cm. long: new leaves purplish, 5–10 pairs, elliptic-oblong, obtuse, slightly narrowed at base, densely glandular-hirsute, 0.5–1.4 cm. long, 1.5–3.5 mm. wide: bracts ovate-lanceolate, acutish or obtuse, scarcely scarious: flowers 1–3: pedicels slender, mostly erect, becoming 1.5–2.5 cm. long, scarcely or only rarely nodding at apex: sepals ovate-oblong, obtuse or subacute, fuscous, glandular, broadly scarious-margined, 5.5–6.5, becoming 6–7 mm. long: petals obtuse, 2-lobed, ascending, twice as long as the calyx: capsule straight, 0.9–1.3 cm. long: seeds 1.3–1.7 mm. in diameter, angulate; the vesicular or loose testa with some faces prominently papillose, others covered with rows of small transverse ridges.—Serpentine barrens of western NEWFOUNDLAND: serpentine tablelands, altitude about 380 m., Bonne Bay, August 27, 1910, *Fernald, Wiegand & Kittredge*, no. 3387½; serpentine tableland and slopes back of Woody Point, Bonne Bay, August 5, 1919, *R. H. Kimball*, no. 150; serpentine tableland, altitude about 550 m., northeastern region of the Blomidon Mts., July 24, 1910, *Fernald, Wiegand & Kittredge*, no. 3390 (TYPE in Gray Herb.) and August 21, 1910, *Fernald & Wiegand*, no. 3390½.

In its large seed with loose testa *C. terrae-novae* is very different from other American species, in this character showing a relationship to the European *C. latifolium* L.



Forma **Waghornei**, n. f., caulibus et foliis et sepalis villosis-hirsutis nec glandulosis.

Stems, leaves and sepals villous-hirsute, not glandular.—NEWFOUNDLAND: sandy plains, Coal (or Serpentine) River, June 26 and 28, 1898, *A. C. Waghorne*, nos. 10 (TYPE in Gray Herb.) and 27.

7. *C. UNALASKENSE* Takeda. Flowering stems stout, 2–4 dm. high, rather densely sordid-hirsute throughout, except rarely at the extreme base; internodes long (median 2.5–10 cm.): leaves of the season 4–6 pairs, ovate to ovate-lanceolate, rarely lance-oblong, acute or acutish, hirsute on both surfaces; the median 1.5–4 cm. long, 0.8–2.5 cm. broad: bracts broadly ovate; the upper with very narrow scarious margins: inflorescence (3–)4–13-flowered, forming a terminal rather small dichotomous cyme, at first congested, in fruit with divaricate or reflexed stout scarcely arching pedicels: sepals in anthesis 7–10 mm. long, in fruit scarcely longer, lanceolate to lance-ovate, acute; the margins narrowly scarious: petals broad, about 1 cm. long, a third longer than the sepals: capsule very large (1.7–2.3 cm. long), twice to thrice the length of the calyx: seeds large, 1.3–1.8 mm. in diameter with long marginal papillae passing on the sides to oblong ridges.—Kew Bull. 1910, 381 (1910). *C. vulgatum*,  $\gamma$ . *macrocarpum* Fenzl in Ledeb. Fl. Ross. i. 409 (1841). *C. alpinum*  $\beta$ . *Fischerianum*, lusus *C. macrocarpum* (Fenzl) Regel, Pl. Radd. i. 439 (1862).—Coast of British Columbia to Kamtchatka and eastern Siberia. The following American specimens have been examined. BRITISH COLUMBIA: thicket, Long Arm, Skiddegate, Queen Charlotte Isl., July 16, 1897, *C. F. Newcombe*, no. 18,252 (in part), Geol. Surv. Can. ALASKA: Shumagin Islands, 1871–72, *M. W. Harrington*; banks, Unalaska, September 25, 1871, June 13, 1872, *M. W. Harrington*; among grasses, etc., on the flats at sea-level, Dutch Harbor, Unalaska, June 29, 1907, *E. C. Van Dyke*, no. 71; Nazan Bay, Atka Island, July 28, 1907, *E. C. Van Dyke*, no. 284; Amchitka Island, July 25, 1873, *W. H. Dall*; Kyska Island, June 30, 1873, *W. H. Dall*.

8. *C. VULGATUM* L. Flowering stems rather slender, 1–6.5 dm. high, simple or slightly branching, hirsute or rarely glandular; internodes elongate, the median becoming 2–12 cm. long: leaves of the season 3–7 pairs, oblong to narrowly oval, hirsute on both surfaces; the median 0.5–4 cm. long, 1.5–15 mm. broad: bracts similar but smaller, broadly scarious at margin and summit: inflorescence 3–about 60-flowered, forming a terminal finally very dichotomous cyme, at first rather congested, in fruit with the lower pedicels divergent or reflexed and 2–4 times as long as the calyx: sepals 4–7 mm. long, ovate-lanceolate, acute, hirsute, the margin scarious: petals 4–8 mm. long, about equaling or very slightly exceeding the sepals, cleft to the middle, with ciliate claw: capsule 7–11 mm. long: seed 0.5–0.7 mm. in diameter, reddish, tuberculate.—Fl. Suec. ed. 2, 158 (1755),

Syst. Nat. ed. 10, 1039 (1759), Sp. Pl. ed. 2, 627 (1762), not L. Herb. *C. viscosum* L. Herb.; Sm. Fl. Brit. 497 (1800), not L. Sp. Pl. i. 437 (1753). *C. caespitosum* Gilib. Fl. Lith. v. 159 (1781). *C. triviale* Link, Enum. Hort. Berol. i. 433 (1821).—Our plants all belong to

Var. *HIRSUTUM* Fries. Inflorescence hirsute with glandless hairs.—Nov. Fl. Suec. ed. 2, 125 (1828). *C. triviale*  $\alpha$ . *hirsutum* Neilreich, Fl. Nied.-Oesterr. 798 (1859). *C. triviale*, var.  $\alpha$ . *genuina* Syme, Engl. Bot. ii. 83 (1873). *C. vulgatum*,  $\alpha$ . *typicum* Beck. Fl. Nied.-Oesterr. i. 367 (1890). *C. caespitosum*, var. *hirsutum* (Fries) Briq. Prod. Fl. Corse, i. 506 (1910).—An abundantly naturalized weed of roadsides, fields, cultivated grounds, and banks of streams, in all inhabited regions of temperate North America, flowering from early spring to late autumn (and exceptionally throughout winter).

Var. *HIRSUTUM*, forma *GLANDULOSUM* (Boenn.) Druce. Inflorescence with gland-tipped hairs.—Druce in Moss, Camb. Brit. Fl. iii. 50 (1920). *C. viscosum*,  $\beta$ . *glandulosum* Boenn. Prodr. Fl. Monast. 133 (1824). *C. triviale*, var. *viscosa* Mert. & Koch in Roehl. Deutschl. Fl. ed. 3, iii. 336 (1831). *C. triviale*,  $\gamma$ . *glandulosum* (Boenn.) Reichenb. Fl. Germ. Excurs. 796 (1832). *C. vulgatum*,  $\epsilon$ . *glandulosum* (Boenn.) Grenier, Mém. Soc. Émul. Doubs, i. 39 (1841). *C. glandulosum* (Boenn.) Schur, Oest. Bot. Zeit. xix 306 (1869). *C. caespitosum*,  $\beta$ . *glandulosum* (Boenn.) Wirtg. Fl. Preuss. Rheinl. 315 (1870). *C. vulgare*, subsp. *triviale*, forma *glandulosum* (Boenn.) Murbeck, Bot. Notiser (1898) 253.—Apparently local in North America. The following specimens belong here. MASSACHUSETTS: Provincetown, June 10, 1912, *F. S. Collins*. MICHIGAN: Turin, Marquette Co., May 31, 1901, *Barlow*. ILLINOIS: Urbana, May 27, 1899, *Gleason*. BRITISH COLUMBIA: Revelstoke and Downie Creek, July, August, 1905, *C. H. Shaw*, nos. 846 and 1118.

In recent years many continental European writers have abandoned the names *C. vulgatum* L. and *C. viscosum* L. as hopelessly confusing and have adopted in their stead later and professedly clear names on the ground that the Linnean names are "sources of permanent error and confusion." The Linnean names, however, have long been used in America as well as in Great Britain and Austria with complete definiteness, and in conformity with one of the leading principles (Art. 5) of the International Rules ("When the consequences of rules are doubtful, established custom becomes law"), they may properly be maintained.

9. *C. ARVENSE* L. Matted or tufted perennial, with depressed or trailing tough basal branches bearing marcescent leaves and abundant axillary fascicles or leafy tufts: flowering branches ascending, simple to freely branched, 0.2–6 dm. high; glabrous to densely villous, glandless to densely glandular: leaves linear-subulate to narrowly

ovate, flaccid to rigid, acute to obtuse, glabrous to velutinous, glandless or glandular, 1–6 cm. long, 0.5–13 mm. broad, mostly confined to the lower two-thirds of the branch: inflorescence few- to many-flowered, its bracts scarious-margined: sepals 4.5–8.5 mm. long, glabrous, pilose or glandular: petals 2–3 times as long as the sepals; the broad lobes spreading in anthesis; the claw glabrous: capsule cylindric, equaling to much exceeding the calyx: seeds reddish, 0.35–0.7 mm. in diameter, the testa close and tuberculate.—Sp. Pl. i. 438 (1753).—Rocky, gravelly or sandy habitats, chiefly in somewhat calcareous or magnesian soils, widely dispersed in boreal regions, extending south in varying forms to Georgia, the Great Lake region, New Mexico and California; Eurasia and South America.

We attempt no statement of bibliography and synonymy at present, since all our attempts to reduce the species-complex to definite species or varieties with natural ranges have proved futile. After carefully measuring sepals, capsules and seeds, and closely examining pubescence and foliage during two different periods of nearly two weeks each we are forced to the conclusion that in North America the group is as unstable in these characters as in Europe where Willkomm found “*varietates constantes vix distingui possunt.*” For instance, a characteristic plant of Pennsylvania and southern New York, which is variously treated as *C. arvense*, var. *oblongifolium* (Torr.) Holl. & Britt., *C. oblongifolium* Torr. and *C. velutinum* Raf., is commonly separated by its long capsule; but abundant collections, which by their discriminating collectors have been referred to this plant, show capsules no longer than in much of the material from Newfoundland or the Canadian Northwest, while many sheets of material collected as one plant show both long and short capsules; and many specimens uniform as to capsules show the greatest diversity in the size and remoteness of the leaves. In some areas essentially all the plants of the *C. arvense* series are quite glandular, in other closely adjacent areas glandless but villous, so that within a limited region it would be possible to subdivide *C. arvense* into variants of seeming stability, but throughout the broad range around the northern hemisphere these variable characters interchange so perplexingly that the writers find themselves at present unable to determine which of these fickle tendencies have real taxonomic value. They accordingly are leaving *C. arvense* as a perplexing, polymorphous species, not wholly abandoned but cheerfully commended to others who care to attack it and who by a new approach and prolonged study may perhaps reduce it to a series of tangible entities.